

Claims

1. Electromagnetic valve for a gas cylinder (1), in particular a gas cylinder (1) for gas-powered motor vehicles, having
- a valve body (4);
 - a threaded portion of the valve body with an external thread (3), which is screwable into an internal thread (2) on the gas cylinder (1);
 - a portion of the valve body (4) projecting into the gas cylinder (1);
 - a shut-off piston (31);
 - electromagnetic control elements (25, 28, 29), by which the shut-off piston (31) is movable from an open position to a closed position,
- wherein the valve body (4) for receiving the shut-off piston (31) and the electromagnetic control elements (25, 28, 29) has a cavity (15), which is disposed inside the threaded portion and/or the portion of the valve body (4) projecting into the gas cylinder (1), **characterized in** that a mouth of the cavity (15) is disposed on the head end (5) of the valve body (4) situated outside of the gas cylinder (1), and the shut-off piston (31) and the electromagnetic control elements (25, 28, 29) can be inserted into the cavity (15) through the mouth.
2. Electromagnetic valve according to claim 1, **characterized in** that disposed in the region of the mouth of the cavity (15) is an external thread (3), into which a screw cap (23) is screwable.

3. Electromagnetic valve according to claim 1 or 2,
characterized in that the valve body (4) has at least
one further receiving space for a further element,
wherein the further element can be inserted into the
5 receiving space through an opening situated outside of
the gas cylinder (1).
4. Electromagnetic valve according to one of the
preceding claims, **characterized in** that the at least
10 one further element is one of the following elements:
- a manual shut-off valve (18),
 - a connection coupling (8) without a non-return
valve,
 - a connection coupling (10) with a non-return valve,
 - 15 • a safety element with rupture diaphragm (20) for
protecting against excessively high pressure,
 - a safety element (22) with a fluid-filled glass
body (50) for thermal protection.
- 20 5. Electromagnetic valve according to one of the
preceding claims, **characterized in** that the valve body
(4) has at least one flow channel (12, 13) connecting
the cavity (15) to at least one coupling piece (8, 10)
outside of the gas cylinder (1).
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6. Electromagnetic valve according to one of the
preceding claims, **characterized in** that the valve body
(4) comprises at least one flow channel (14, 16)
connecting the cavity (15) to a mouth into the
30 interior of the gas cylinder (1).

7. Electromagnetic valve according to one of the preceding claims, **characterized in** that the valve body (4) comprises at least one flow channel (16, 19, 21) connecting the at least one receiving space to a mouth
5 into the interior of the gas cylinder (1).
8. Electromagnetic valve according to one of claims 6 or 7, **characterized in** that a flow restrictor (17) is disposed on the mouth into the interior of the gas
10 cylinder (1).
9. Electromagnetic valve according to one of the preceding claims, **characterized in** that a filter (54) is disposed on the mouth into the interior of the gas
15 cylinder (1).
10. Electromagnetic valve according to one of the preceding claims, **characterized in** that a protective device against mechanical actions is provided on the
20 head end (5) of the valve body (4) situated outside of the gas cylinder (1).
11. Electromagnetic valve according to claim 10, **characterized in** that the protective device is a
25 protective plate (6).
12. Electromagnetic valve according to claim 10 or 11, **characterized in** that the head end (5) of the valve body (4) has rounded or chamfered edges.
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13. Electromagnetic valve according to one of claims 10 to 12, **characterized in** that the protective plate (6) has at least one support rib (57).

14. Electromagnetic valve according to one of claims 10 to 13, **characterized in** that disposed in the protective plate (6) is at least one cutout (58), which is preferably situated close to at least one support rib (57).
15. Electromagnetic valve according to one of claims 10 to 14, **characterized in** that an elastic layer (7) is disposed between the protective plate (6) and the head end (5) of the valve body (4).
16. Electromagnetic valve according to claim 15, **characterized in** that the elastic layer (7) is made of a thermoplastic polymer.
17. Electromagnetic valve according to one of the preceding claims, **characterized in** that the head end (5) of the valve body (4) is designed as a polygon, in particular a quadrilateral or hexagon.
18. Electromagnetic valve according to one of claims 4 to 17, **characterized in** that the gas cylinder (1) can be attached to a motor vehicle with a passenger compartment, that the valve comprises a plurality of safety elements (18, 20, 22), which have an efflux opening (59) situated outside of the gas cylinder (1), wherein all of the efflux openings are disposed on the valve body (4) at a side remote from the passenger compartment.
19. Electromagnetic valve for a gas cylinder (1), in particular a gas cylinder (1) for gas-powered motor vehicles, having

- a valve body (4) connected in a sealed manner to the gas cylinder (1);
- a shut-off piston (31) disposed in the valve body (4);
- 5 • an annular space (37), which is situated in front of the outer annular face of the front of the shut-off piston (31) and connected to the interior of the gas cylinder (1);
- 10 • a connection channel (38), which is situated in front of the central region of the front of the shut-off piston (31) and leads out of the valve body (4);
- 15 • a main seal (39), which is disposed on the front of the shut-off piston (31) and can be pressed by means of the piston (31) against a main seal seat (40) in order to seal off the annular space (37) from the connection channel (38),
- 20 • electromagnetic control elements, which are disposed in the valve body (4) and move a pilot seal (33), which is pressed by a pretension spring (35) against a pilot opening, away from said pilot opening;
- 25 • a pressure reduction channel (32) in the shut-off piston (31), which pressure reduction channel opens out in the pilot opening and connects the rear of the shut-off piston (31) facing the control elements (25, 28, 29) to the front of the shut-off piston (31);
- 30 **characterized in** that the shut-off piston (31) is disposed in a substantially freely displaceable manner in the valve body (4) and it is exclusively the pretension spring (35) for the pilot seal (33) that

develops a pretension force that presses the shut-off piston (31) against the main seal seat (40).

20. Electromagnetic valve according to claim 19,
5 **characterized in** that the pressure reduction channel (32) opens out via flow channels at the front of the shut-off piston (31) close to the main seal seat.